No additional fee is required.

In the event a fee is required or if any additional fee during the prosecution of this application is not paid, the Patent Office is authorized to charge the underpayment to Deposit Account No. 50-2215.

CONTINGENT EXTENSION REQUEST

If this communication is filed after the shortened statutory time period had elapsed and no separate Petition is enclosed, the Commissioner of Patents and Trademarks is petitioned, under 37 CFR 1.136(a), to extend the time for filing a response to the outstanding Office Action by the number of months which will avoid abandonment under 37 CFR 1.135. The fee under 37 CFR 1.17 should be charged to our Deposit Account No. 50-2215.

AMENDMENTS

In the Claims:

Please amend claims 1, 2, 5, 6, 7 and 9 and add new claims 10-14 pursuant to 37 CFR 1.121(c)(i) as set forth in the "clean" version below. Entry is respectfully requested. A version with markings to show the changes made pursuant to 37 CFR 1.121(c)(ii) is attached hereto.

Claim 1. (Amended) An array antenna reception apparatus comprising: an array antenna having M antenna elements linearly laid out on each side of a polygon having K sides, M being an integer of not less than 1, K being an integer of not less than 3; K adaptive receivers each for receiving reception signals from the M antenna elements for a corresponding side, independently forming a directional pattern having a gain in a desired signal direction for the side, receiving a desired signal, and suppressing an interference signal; and a demodulated signal synthesizer for receiving K demodulated signals as outputs from said K adaptive receivers, weighting and synthesizing the signals, and outputting a

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demodulated signal for a user.

Claim 2. (Amended) An apparatus according to claim 1, wherein the direction pattern of each side of said array antenna is formed outside each side of the polygon.

Claim 5. (Amended) An apparatus according to claim 1, wherein said demodulated signal synthesizer performs a weighting synthesis so as to maximize a ratio of desired signal power to interference power in weighting and synthesizing the K demodulated signals.

Claim 6. (Amended) An apparatus according to claim 1, wherein each of said K adaptive receivers comprises:

M despread means for receiving code division multiple access (CDMA) signals received by said M antenna elements and a determination symbol obtained by a hard determination for the demodulated signal by a user, and despreading each of the M antenna reception signals using a desired user spread code,

a weighting synthesizer for forming a directional pattern based on antenna weights,

a demodulator for receiving the directional pattern and for estimating a transmission path,

a multiplier for multiplying a user determination symbol by an output from said demodulator to cancel a phase change caused by phase lock of a carrier wave,

a subtracter for subtracting an output from said weighting synthesizer from an output from said multiplier to detect an antenna weight control error,

delay means for delaying outputs from said M spread means in accordance with a processing time of said demodulator, and

antenna weight control means for controlling and outputting the antenna weights on the basis of a least mean square error (MMSE) so as to minimize average power of the antenna weight control error using outputs from said delay means and the antenna weight control error.

Claim 7. (Amended) An apparatus according to claim 1, wherein each of said K adaptive receivers comprises:

M despread means for receiving code division multiple access (CDMA) signals received by said M antenna elements and despreading each of the M antenna reception signals using a desired user spread code,

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arrival direction estimation means for estimating an arrival direction from outputs from said M despread means,

antenna weight generation means for generating antenna weights from outputs from said arrival direction estimation means,

a weighting synthesizer for forming a directional pattern from the antenna weights,

and a demodulator for receiving the directional pattern and for estimating a transmission path.

Claim 9. (Amended) An apparatus according to claim 6, wherein:

said demodulator comprises transmission path estimation means for receiving an output from said weighting synthesizer and estimating an amplitude and phase of the carrier wave,

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complex conjugate operation means for obtaining a complex conjugate of a complex transmission path estimation value as an output from said transmission path estimation means, and

a multiplier for multiplying an output from said despread means by an output from said complex conjugate operation means to phase-lock the carrier wave.

10. (New) An antenna apparatus comprising:

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an array antenna including M antenna elements disposed on each side of a K sided polygon, M being an integer equal or greater than one, K being an integer greater than 2, each antenna element effective to produce a respective antenna signal;

K adaptive receivers, each coupled to antenna elements on one respective side of the antenna array, each respective adaptive receiver receives the antenna signals from the

respective side of the array and are effective to form a direction pattern having a gain in a desired signal direction for the respective side of the array antenna; and

a demodulated signal synthesizer which receives the outputs from the adaptive receivers, weighs the outputs, synthesizes the outputs, and produces a demodulated signal.

11. (New) The antenna apparatus as recited in claim 10, wherein the adaptive receivers are effective to suppress an interference signal.

12. (New) The antenna apparatus as recited in claim 10, wherein the demodulated signal synthesizer produces the demodulated signal based on a particular output from a particular adaptive receiver which has the greatest signal power after being weighed and synthesized.

13. (New) The antenna apparatus as recited in claim 10, wherein the demodulated signal synthesizer produces the demodulated signal based on a particular output from a particular adaptive receiver which has the greatest signal to noise ratio after being weighed and synthesized.

14. (New) The antenna apparatus as recited in claim 10, wherein each adaptive receiver comprises:

M despreading circuits which each receive a respective antenna signal from a respective antenna element, each despreading circuit despreads the respective signal using a user spread code to produce respective despread signals;

a weighting synthesizer which receives the despread signals and produces a directional pattern based on antenna weights;

a demodulator which receives the directional pattern and estimates a transmission path in response thereto;

a multiplier which receives and multiplies a user determination symbol and an output of the demodulator to produce a phase change signal;

a subtractor which receives and subtracts the directional pattern from the phase change signal to produce an antenna weight error signal;

a delay circuit which receives and delays the respective despread signals to produce delayed despread signals; and

an antenna weight control circuit which receives the delayed despread signals and the antenna weight error signal and outputs the antenna weights in response thereto.